REMARKS

Applicant has amended claims 212 and 281 to add a period at the end of each of these claims, claim 238 to correct a typographical error on the dependency of this claim, and claims 197, 227, 273, and 279 have been amended as set forth above. Applicant notes with appreciation the Office's indication that claims 215 and 245 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicant respectfully requests clarification on the status of claims 233, 257-268, 270, 271, and 278 which currently are elected claims, but which were not addressed in this Office Action. If claims 233, 257-268, 270, 271, and 278 are rejected for the first time in the next action, Applicant assumes this will be a non-final office action to provide Applicant the opportunity to respond for the first time to any objection or rejection. In view of the above amendments and the following remarks, reconsideration of the outstanding office action is respectfully requested.

The Office has objected to claims 212 and 281 asserting a period at the end of the claim is missing. As set forth above, Applicant has amended claims 212 and 281 to correct the typographical error and add the missing period. In view of the foregoing amendments and remarks, the Office is respectfully requested to reconsider and withdraw these objections.

The Office has rejected claims 197, 198, 201, 227, 228, and 231 under 35 U.S.C. 102(b) as being anticipated by US Patent No. 5,294,970 to Dornbusch (Dornbusch), claims 279-283 under 35 U.S.C. 102(b) as being anticipated by US Patent No. 5,889,490 to Wachter (Wachter), claims 202, 232, and 253 under 35 U.S.C. 103(a) as being unpatentable over Dornbusch, claims 203, 223, and 232 as being unpatentable over Dornbusch in view of US Patent No. 6,450,267 to Ohtomo (Ohtomo), claims 207-209 and 237-239 as being unpatentable over Dornbusch in view of Wachter, claims 212 and 242 under 35 U.S.C. 103(a) as being unpatentable over Dornbusch in view of US Patent No. 5,751,406 to Nakazawa (Nakazawa), claims 213, 214, 243, 244, 269, 271, 273, 274, 275, 276, 277, and 228 under 35 U.S.C. 103(a) as being unpatentable over Dornbusch in view of US Patent No. 5,767,409 to Yamaguchi (Yamaguchi), claims 217 and 247 under 35 U.S.C. 103(a) as being unpatentable over Dornbusch in view of US Patent No. 6,288,776 to Cahill (Cahill), claims 219 and 249 under 35 U.S.C. 103(a) as being unpatentable over Dornbusch in view of US Patent No. 5,870,180 to Wangler (Wangler), claims 220, 221, 250, and 251 under 35 U.S.C.

103(a) as being unpatentable over Dornbusch in view of US Patent No. 5,589,928 to Babbitt (Babbitt), claims 224 and 254 under 35 U.S.C. 103(a) as being unpatentable over Dornbusch in view of US Patent No. 5,612,883 to Schaffer (Schaffer), and claim 284 under 35 U.S.C. 103(a) as being unpatentable over Wachter.

The Office asserts Dornbusch shows: transmitting at least one signal towards a target (figure 4); receiving at least one of a return signal sent in response or the reflected signal (figure 4 and 5); equivalent time sampling of at least one portion of the signal (inherent with any computer system that samples a signal); and determining a measured parameter based on the amplitude of the signal. The Office also asserts Wachter shows a transmission of a coherent burst (column 5 line 1-8), a receiving portion (figure 3), a sampling of at least one portion of the received signal (column 1-3), and determining the distance based on the phase difference between the received and transmitted signal (column 1-5).

Further, the Office asserts Dornbusch does not show a method comprising encoding data on the signal for transmitting, but asserts Ohtomo shows a method for filtering a signal and encoding data on that signal (figure 3 Ref 32). The Office asserts Dornbusch does not show a signal that is a coherent burst modulation waveform, but asserts Wachter shows a method for measuring a parameter of an object that includes a coherent burst modulation waveform (column 18). The Office asserts Dornbusch does not show amplifying and filtering the received portion of the transmitted signal back from the target, but asserts Nakazawa shows a method for measuring a parameter of an object that includes amplifying and filtering the received portion of the transmitted signal back from the target (figure 6). The Office asserts Dornbusch does not show sampling of multiple portions of the received signal and the determining further comprises determining the measured parameter based on an average of the phase difference between the transmitted signal and the sampled portions of the received signal, but asserts Yamaguchi shows a method for measuring a parameter of an object that includes sampling of multiple portions of the received signal and the determining further comprises determining the measured parameter based on an average of the phase difference between the transmitted signal and the sampled portions of the received signal (column 1 and 2). The Office asserts Dornbusch does not show determining a phase offset from a baseline wherein the measured parameter is based on the phase offset and the phase difference, but asserts Cahill shows a method for measuring a parameter of a target including determining a phase offset from a baseline wherein the measured parameter is based on the phase offset and the phase difference (column 2). The Office asserts Dornbusch does not

show using a look-up table to correct for one or more errors in the measured parameter, but asserts Wangler shows a method for measuring a parameter of a target including using a look-up table to correct for one or more errors in the measured parameter (column 11 and 12). The Office asserts Dornbusch does not show determining a refractive index of a medium in which the transmitted signal propagates wherein the measured parameter is based on the refractive index of the medium and the phase difference, but asserts Babbitt shows a method for measuring a parameter of a target that show determining a refractive index of a medium in which the transmitted signal propagates wherein the measured parameter is based on the refractive index of the medium and the phase difference and temperature and pressure readings (column 6 lines 25-60). The Office asserts Dornbusch does not show a comparing the measured distance against a threshold distance and providing a collision alert when the comparing indicates the measured distance is less than the threshold distance, but asserts Schaffer shows a method for measuring a parameter of a target including a comparing the measured distance against a threshold distance and providing a collision alert when the comparing indicates the measured distance is less than the threshold distance (column 30-58).

Dornbusch, Wachter, Ohtomo, Nakazawa, Yamaguchi, Cahill, Wangler, and Schaffer, alone or in combination do not disclose or suggest, "equivalent time sampling of at least one portion of the received signal at less than the Nyquist condition" as recited by claim 197, "an equivalent time sampling system that samples at least one portion of the received signal at less than the Nyquist condition" as recited by claim 227, "equivalent time sampling at least one portion of the received signal at less than the Nyquist condition" as recited by claim 273, or "equivalent time sampling at least one portion of the received signal at less than the Nyquist condition" as recited by claim 279.

Contrary to the Office's assertions equivalent time sampling of at least one portion of the signal at less than the Nyquist condition is not inherent with any computer system. The Office's attention is respectfully directed to FIG. 7 and to paragraphs 122 and 123 in the above-identified patent application which provide an exemplary description of this sampling and which are set forth below:

> [0122] Referring to FIG. 7, a timing diagram showing the timing relationships between the various digital and analog signals within a burst is illustrated. First, an 80 MHz Master Clock Waveform is generated from a free running crystal oscillator in clock circuitry 106(1). The frequency of 80 MHz was chosen to be four times the burst modulation frequency so that quarter-period sampling signals, that is P/4, are available. The 80 MHz master clock is then simply

divided by four to make the Emission Clock Waveform by burst waveform generator 104. The Emission Clock Waveform is then gated to make the bursts, low pass filtered, routed to the laser driver, and then emitted as light as described above, and shown as the Emitted Light Waveform in FIG. 7. Also, a portion of the emitted light reflects off of the target T and is collected by the focusing system 112 onto the photodiode 114 and is filtered and amplified by the tuned amplifier 116(1). The resulting signal, the Received Signal, is time delayed with respect to the Emitted Light Waveform. The amount of the delay is proportional to the distance to the target T, after ignoring internal signal propagation delays and multi-half-period ambiguities. This Received Signal is presented to the analog input of the equivalent-time-sample-and-hold circuit 118(1). Also presented to the equivalent-time-sample-and-hold circuit 118(1) is a digital signal, shown as the Sampling Clock Waveform in FIG. 7, which is created in the clock circuitry 106(1), and is asserted every NP + P/4 seconds, where N is an integer, typically 100, and P is the period of the Received Signal, 50ns in this example. When the Sampling Clock is asserted (goes high in this example) the Received Signal is sampled, and presented, unvarying, at the output of the equivalent-time-sample-and-hold circuit. This signal is the Sampled Signal waveform as shown at the bottom of FIG. 7, and is periodic, but much lower in frequency than the Received Signal.

[0123] In conventional waveform sampling systems, the waveform is sampled at a rate higher than twice the highest frequency present in the waveform. This is the Nyquist condition, and it allows for the complete representation in digital format of the sampled analog signal. However, the burst signal to be sampled is substantially of a single frequency, being 20MHz in this example, and can be sampled in equivalent time to reduce the speed requirements, and the cost, of the analog to digital conversion system. If it is required by the digital processing system 102 that four samples are obtained per cycle of the 20MHz signal, every P/4 seconds where P is the period of the 20MHz signal, then the sampling rate in conventional sampling systems would be 80 MHz. But in equivalent time sampling this requirement is relaxed provided that each sample is NP + P/4 seconds apart, where N is an integer. For example, if N = 100, and noting that P = 50ns, then 100P + P/4 = 5.0125μs, for a sampling frequency of 199.50 kHz. This low sampling speed is amenable to low A/D costs, and high A/D resolution. Four samples would then require approximately 20.05μs to collect, which is comfortably less than the 25μs burst duration given at the start of the example.

Accordingly, with equivalent time sampling at less than the Nyquist condition, the present invention is able to reduce the cost of manufacturing the measuring system, while still maintaining accuracy down to 1 mm and providing a compact and eye safe design. As the Office has acknowledged by arguing that sampling is inherent in Dornbusch, this reference does not disclose or suggest anything related to the sampling rate, let alone equivalent time

sampling at less than the Nyquist condition. Similarly, none of the other cited references by the Office disclose or suggest equivalent time sampling at less than the Nyquist condition.

Therefore, in view of the foregoing amendments and remarks, the Office is respectfully requested to reconsider and withdraw the rejections of claims 197, 227, 269, 273, and 279. Since claims 198, 201-203, 207-209, 212-214, 217, 219-221, 223, 224, 269, and 270 depend from and contain the limitations of claim 197, claims 228, 231-233, 237-239, 242-244, 247, 249-251, 253, 254, and 271 depend from and contain the limitations of claim 227, claims 274-287 depend from and contain the limitations of claim 273, and claims 280-284 depend from and contain the limitations of claim 279, they are distinguishable over the cited references and are patentable in the same manner as claims 197, 227, 273, and 279.

The Office has objected to claims 215 and 245 as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. In view of the foregoing amendments and remarks with respect to claims 197 and 227 from which these claims depend, claims 215 and 245 are believed to be in condition for allowance and the Office is respectfully requested to reconsider and withdraw this objection.

In view of all of the foregoing, Applicant submits this case is in condition for allowance and such allowance is earnestly solicited.

Respectfully submitted,

Date: April 25, 2006

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4/25/06	Sherri A. Moscato
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